

REMARKS

The Examiner has rejected claims 1-4, 6, and 12 under 35 U.S.C. § 103(a) as being unpatentable over Carmello et al. (EP1110605) in view of Beck (US 3,887,004).

Claim 1 recites a multi-tubular reactor comprising, among other things, at least one monolithic catalyst or catalyst support comprising axially oriented variations about its circumference. Figure 2 illustrates one embodiment of such a catalyst or catalyst support.

In the Final Office Action the Examiner asserts that Carmello et al. discloses, "...The monolith should be in contact with the fixed fed [sic bed] reactor tube walls in such a way as to provide sufficient heat removal." (see section [0019]; also, see claim 25) and that "Each monolith had a cylindrical shape...*its external diameter (d) being the same as the internal diameter of the reactor tubes...*" (see section [0037]). The Examiner asserts that the operating gap distance (Gap_{op}) appears to approximately equal zero and that it would have been obvious for one having ordinary skill in the art at the time the invention was made to configure the operating gap distance to approach approximately zero, in order to provide sufficient heat transfer between the monolith to the reactor walls.

The Examiner acknowledges that Carmello et al. fails to disclose that at least one monolithic catalyst or catalyst support structure comprises axially oriented variations, or that the operating gap distance between the reactor tube and the monolithic catalyst support structure varies along the length of the reactor tube. However, the Examiner concludes that it would have been obvious to provide such variations in view of Beck.

Applicants respectfully traverse this rejection. As mentioned by the Examiner Carmello et al. does not teach or suggest axially oriented variations on a monolith as

recited in claim 1 or varying the operating gap distance between the reactor tube and the monolithic catalyst. Applicants respectfully submit that it would not have been obvious to combine the Examiners cited teaching of Beck with Carmello et al. to do that modification.

Carmello et al. at paragraph [0019] mentions that the monolith should be in contact with the fixed bed reactor tube walls in such a way as to provide sufficient heat removal. For instance, paragraph [0037] states that the external diameter of the monolith uses the same internal diameter of the reactor tubes. These disclosures do not suggest introducing controlled variations in the size of the operating gap by way of axially oriented variations in the monolith or any advantage of doing so. Instead, such a modification would have presumably reduced, rather than enhanced, contact between the monolith and reactor wall. The Examiner's reference to Beck for introducing these variations thus appears to improperly use hindsight as the basis for this rejection. MPEP § 2142.

In addition, the fins or grooves of Beck are disclosed as providing flow conduits or flow channels 36 for the flow of a fluid [column 4, lines 48-53 and column 7, lines 49-54]. In contrast, the flow of gas in the reactors of Carmello et al. is through the channels of the monoliths, rather than through purposefully designed flow paths between the monoliths and tube walls. For this additional reason, one skilled in the art would not have been motivated to introduce the fins or grooves of Beck into the monoliths of Carmello.

Based upon the above remarks, applicant believes the pending claims of the above-captioned application are in allowable form and patentable over the documents of record. Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Appl No.: 10/750,472
Response Dated: January 29, 2009
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Page 7

Applicant authorizes the Office to charge any necessary fee or surcharge with respect to said time extension to the deposit account of the undersigned firm of attorneys, Deposit Account 03-3325.

Please direct any questions or comments to Steven J. Scott at 607-974-3322.

Respectfully Submitted,

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